

CHAPTER 3

Functional Space Requirements

3-1 General

a. Army arts and crafts activities are classified under basic categories. Each primary category includes a number of other activities. A minimum of the seven basic arts and crafts constitutes the essential program at Army installations. Additional activities may be added to the program as demand and resources permit.

b. This section of the guide examines the activities, participants, equipment, physical and technological requirements, space allocations and relationships for the following primary arts and crafts:

HANDCRAFTED POTTERY AND CERAMICS / glass-work, mosaics

DRAWING AND PAINTING / printmaking, serigraphy, layout and advertising design

JEWELRY AND ART METAL / enameling, lapidary, casting

WEAVING, TEXTILES AND GENERAL HAND-CRAFTS / leather, clothing and accessories

SCULPTURE AND THREE-DIMENSIONAL DESIGN / plastics, display models, interior decoration

PHOTOGRAPHY / film making, experimental processes

WOODWORK AND REPAIR / upholstery, refinishing

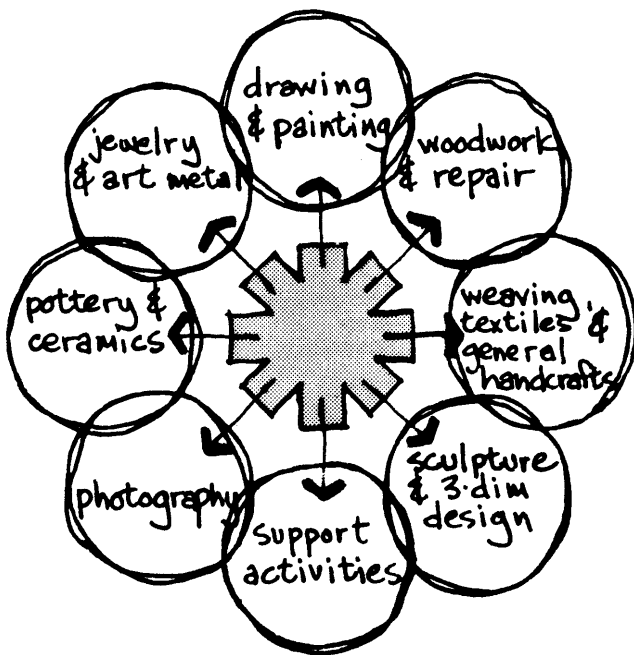
c. There are also support activities which generate space requirements such as lobby, lounge, exhibit areas, library, studio/classroom, office, sales area, tool issue area, storage, rest rooms, and service areas.

d. The criteria contained in this guide applies to all sizes of Arts and Crafts Centers. However, as an example a 20,650 square foot facility was chosen to illustrate this criteria. AR 28-1 states that the allocation of area within the center should conform to the following space distribution:

General Arts and Crafts	40%
Photography	10%
Woodwork and Repair	35%
Support Activities	15%

e. AR 28-1 further states that space allocation within the general arts and crafts areas (40%) will be balanced between the various activities, and if the expansion of one activity requires more than 20% of the overall space in the general arts and crafts area, it should be located in a separate specialized facility.

f. At the end of this Chapter there are two tables showing example space allocations. Example A follows the conventional pattern of separating the building into self-contained areas for each Activity listed above. Example B follows the concept of shared space which only separates incompatible or specialized activities and provides one large flexible general work area proportionately shared by each Activity.



Functional Areas

3-2 Handcrafted Pottery and Ceramics

a. ACTIVITIES

(1) The process whereby earth clays and minerals are transformed into utilitarian and decorative objects is one of civilization's earliest forms of expression. Clay is worked by several methods including hand modeling, throwing on a potter's wheel, and casting. After pieces have dried, they are fired to form a bisque, glazed, and fired again. A comprehensive program includes clay preparation, forming techniques, decorating, firing procedures, and glaze formulation. The process by which a novice is familiarized with the techniques includes demonstrations, lectures, graphic presentations, and practice.

(2) Mold making is an activity related to pottery reproduction. The actual making of molds of one's own design is a creative experience. Casting of clay in ceramic molds is a repetitive process which relates more to commercial manufacturing. Such ceramic mold activities are not normally a function of the Arts and Crafts Center and if provided should be housed in a separate facility.

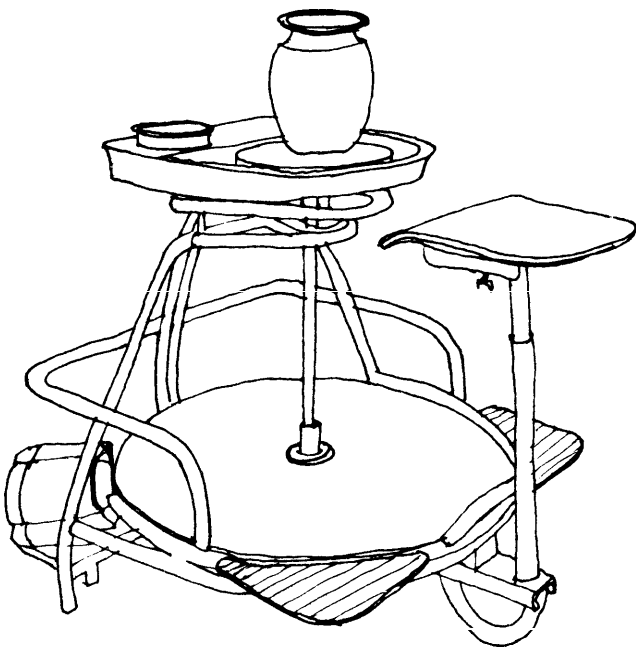
(3) Additional activities in the clay and mineral category involve working with glass. Mosaics, stained glass and etching, designing, forming and dumping of glass can be performed in the general arts and crafts studio as they are compatible with most other craft processes. However, glassblowing does have a considerable influence on facility design and is treated separately in this chapter.

b. PARTICIPANTS

Military personnel, dependents, retirees, and some civilian personnel will all have access to the pottery and ceramics facilities. The range of ability of the participants will be wide, and novices are usually encouraged by the more experienced. In a 20,650 square foot center, users will generally be limited to no more than 20 at one time. At least one supervisor should be present at all times.

c. PHYSICAL REQUIREMENTS

(1) Ceramic/pottery activities may be conducted within the common area of the general arts and crafts space. This includes work areas for designing, forming and glazing. However, kilns, which generate a great amount of heat, should be separated from the general work area. Working with clay can be dusty and, where possible, should be separated from other craft works. Materials often come in large containers, so storage rooms should be convenient to service entrances. Room surfaces should be nonporous and easily cleaned. Sloped floors with drains are desirable. Storage for drying of pottery is required in an area separate from the general work space.



(2) Studio layout should reflect the step by step progression of the process. Correct operation of the kilns is crucial and should be under the visual control of a supervisor. Electric kilns generate a low amount of heat and may be used for bisque and low fire glazing; they are the most commonly used type at Arts and Crafts Centers. Gas kilns are high-heat units used for high fire and are in demand where more sophisticated programs are offered.

(3) Outside covered work space is desirable in moderate climates. This is especially true for high-heat generating kilns which can be built outdoors.

d. RECOMMENDED SPACE ALLOCATIONS

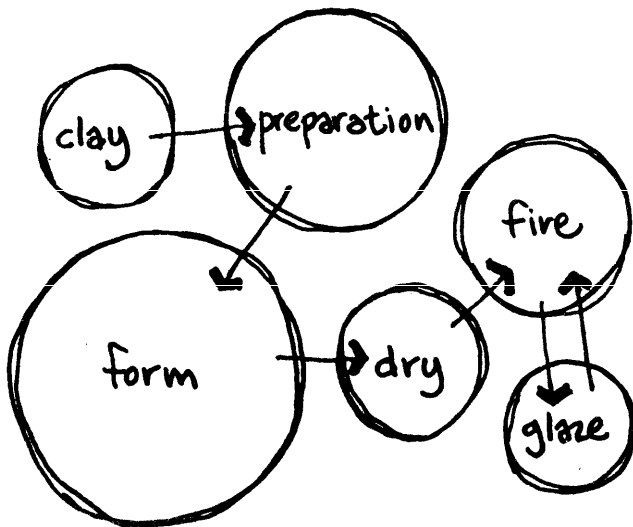
For a center of 20,650 square feet, approximately 1,600 square feet should be allocated to ceramics/pottery.

Work Area	1,000 square feet
Kiln Room	200 square feet
Storage	200 square feet
Covered Exterior Work Area	200 square feet*

*Amount indicates half of actual exterior area provided since covered exterior work area is programmed as half of interior building space.

e. RELATED AREAS

The office and tool issue room should be nearby. Clay storage should be near a service entrance, Kilns and glassblowing furnaces are compatible and can be isolated together, preferably on exterior walls or outdoors where climate permits.



Process

f. FURNISHINGS - EQUIPMENT

Major items of equipment include: wedging boards, kiln carts, electric ceramic kilns, gas ceramic kiln, enamel kilns, portable clay storage cabinets, dampproof cabinets, drying cabinets, potter's wheels, work tables with metal tops, sinks, and spray booths.

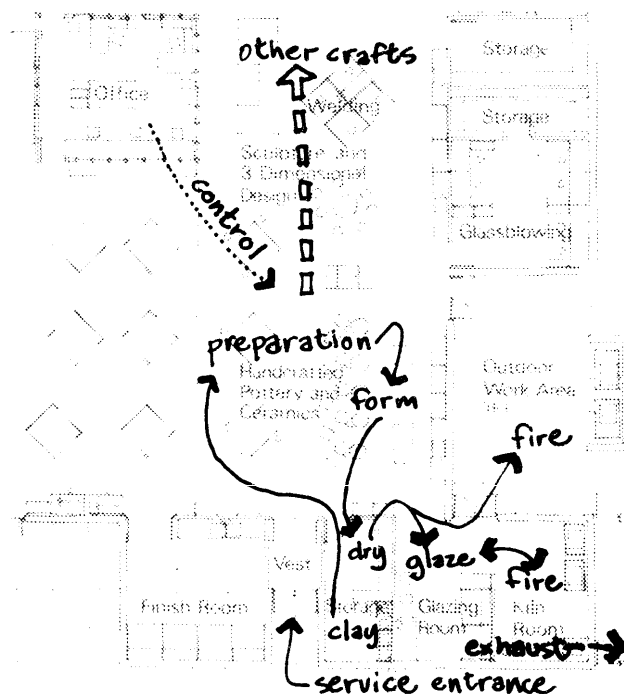
g. TECHNOLOGICAL REQUIREMENTS

(1) A mechanical exhaust system with hoods must be provided over the kilns. If air conditioning is used in work areas, the kilns should be isolated and exhausted separately to minimize cooling demand.

(2) A dust removal system is desirable in the clay preparation area.

(3) Gas supply is required for gas kilns and 220-240 volt electric feeds for other ceramic kilns. Many enameling kilns operate on 110-120 volt current, as do potter's wheels, and other portable equipment. Outlets should be available at work tables. Lighting in work areas should be even and meet normal office space requirements.

(4) Work sinks must have sediment traps. Floor drains for washdown are desirable.



3-3 Glassblowing

a. ACTIVITIES

The popularity of glassblowing has grown rapidly, and there is an increasing demand for facilities and programs for free blowing in Arts and Crafts Centers. Although it is actually a part of Handcrafted Pottery and Ceramics, glassblowing is treated separately since it is so specialized and has its own specific physical and technological requirements. The basic process starts with the production of molten glass within a refractory container in a furnace. Molten glass can be made either by melting glass or by fusing together the raw materials that form glass. The molten glass is then gathered on the tip of a hollow-iron blowpipe and is inflated, spun, tooled, sheared and manipulated to the desired shape. The glass on the end of the tube is maintained in a molten state by a small furnace called a "Glory Hole". The glass is finally tempered in an annealing oven.

b. PARTICIPANTS

Only a small number, less than 10, can participate at any one time in the space normally allocated in a 20,650 square foot center. At least one supervisor should be present at all times.

c. PHYSICAL REQUIREMENTS

Glassblowing produces a great amount of heat, requires a generous amount of space per participant, and therefore is an incompatible activity to include in the general arts and crafts area. More suitably it belongs in a covered outdoor space or in a well ventilated foundry-type room. If indoors, furnaces should be near an exterior wall and have mechanical exhaust systems. Concrete floors, masonry walls and exposed ceiling construction are all appropriate. Storage is required for materials and tools.

d. RECOMMENDED SPACE ALLOCATIONS

For a center of 20,650 square feet, approximately 600 square feet should be allocated to glassblowing.

Work Area	400 square feet
Storage Area	100 square feet
Covered Exterior Work Area	100 square feet*

*Amount indicates half of actual exterior area provided since covered exterior work area is programmed as half of interior building space.



e. RELATED AREAS

Outdoor work areas for gas kilns. Storage Areas.

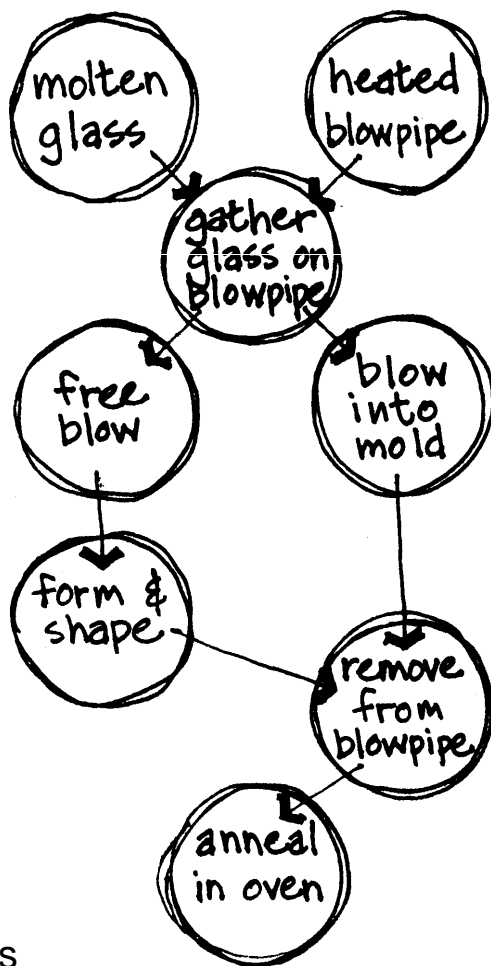
f. FURNISHINGS-EQUIPMENT

The prime equipment items are the melting or pot furnace, "Glory Hole" furnaces, and annealing oven. Craftsmen work at special benches with arms for rolling the blowpipes. A marver where glass is chilled and molded is essential. A portable yoke is provided at the entrance to the "Glory Hole" furnace. Water buckets placed on the floor are required to clean blowpipes. Small drop-off

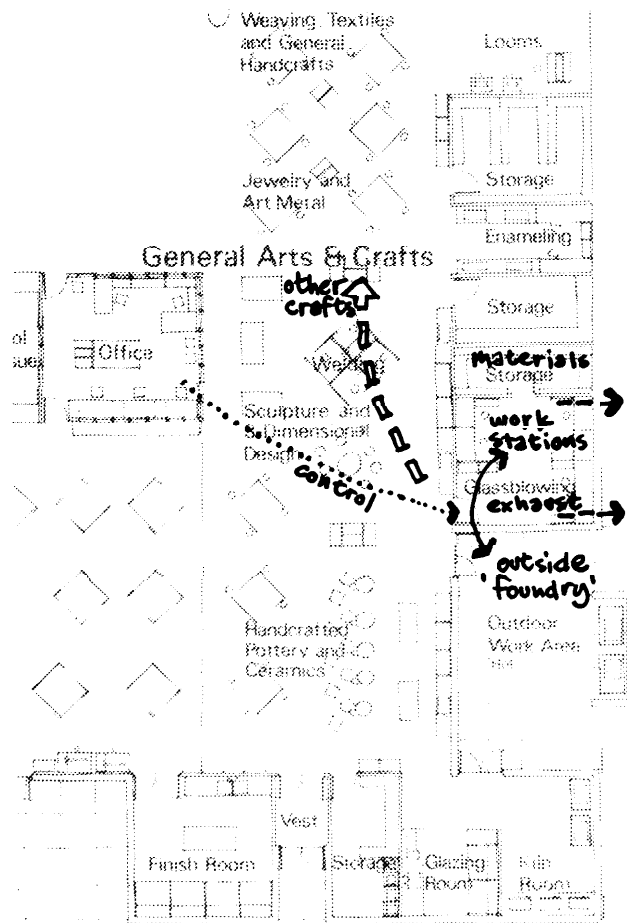
boxes catch pieces knocked from blowpipes. A heavy-duty work counter with asbestos top should be provided. Storage shelves or cabinets for annealed products, materials and tools are required.

g. TECHNOLOGICAL REQUIREMENTS

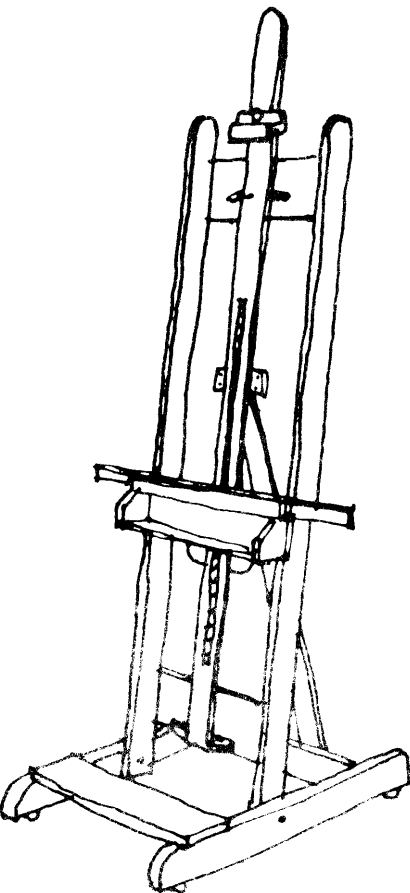
Gas supply is required for furnaces and ovens. Annealing ovens require 208 single or three phase, or 277 single or 480 three phase volt connections or gas. Glassblowing produces great heat which necessitates a large amount of ventilation, natural or mechanical, to keep work areas bearable. All furnaces require exhaust hoods.



Process



3-4 Drawing and Painting



a. ACTIVITIES

In addition to painting and drawing in a variety of media, the graphic arts program includes design projects, drafting, wood and linoleum block printing, etching, lithography, and silkscreen painting.

b. PARTICIPANTS

If properly scheduled, as many as 40 to 50 users with one or two staff members can be accommodated at one time in the space normally allocated in a 20,650 square foot center.

c. PHYSICAL REQUIREMENTS

The general area used for graphics can be typical studio space. Painted block or panel walls and acoustic ceilings are adequate. Surfaces should be washable. Acid-resistant, impervious floors such as treated concrete or quarry tile are very desirable in graphic arts areas. However, since the area serves several arts and crafts, it may be necessary to compromise on floor covering and use high quality resilient flooring throughout. Natural north light is desirable for painting and drawing areas, as is convenient access to an outdoor painting court. Toxic chemicals are used in etching and silkscreen processes and for safety they should be used away from other activities. An outdoor area for cleaning silkscreens or an acid room is desirable. Storage may be required in a general storage area with secure provisions for acid storage

d. RECOMMENDED SPACE ALLOCATIONS

For a center of 20,650 square feet, approximately 1,760 square feet should be allocated to drawing and painting.

General Work Area	1,200 square feet
Acid Room	60 square feet
Storage Room	300 square feet
Covered Exterior Work Area	200 square feet*

*Amount indicates half of actual exterior area provided since covered exterior work area is programmed as half of interior building space.

e. RELATED AREAS

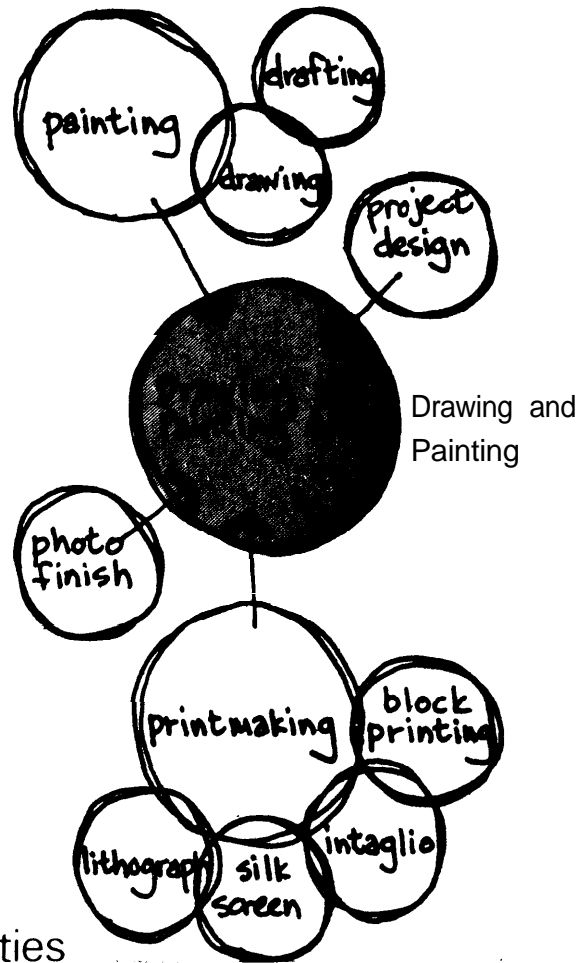
Office
Photography
Exterior Work Areas
Studio/Classroom/Gallery

f. FURNISHINGS - EQUIPMENT

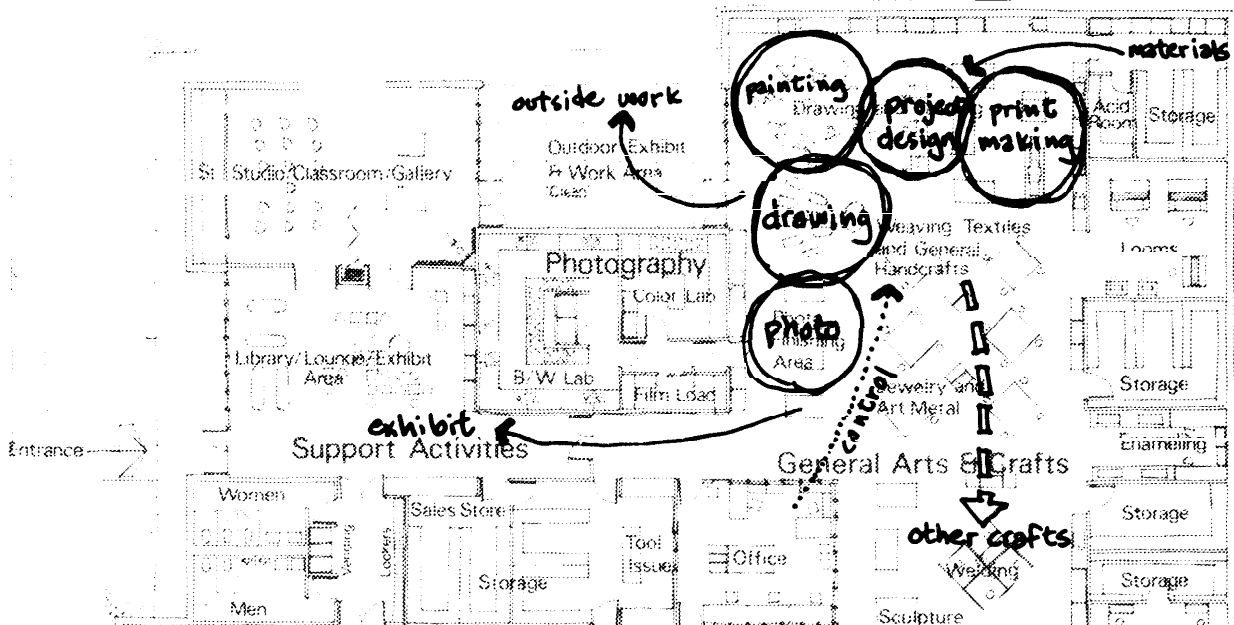
Major Items of equipment include, printing presses, block printing presses, drawing tables, paper cutters, easels, paper storage cabinets, chairs and stools, display cases, work tables with surfaces for cutting, drying racks for prints, slatted storage for canvases, a slide projector with screen, portable easels, and work sinks.

g. TECHNOLOGICAL REQUIREMENTS

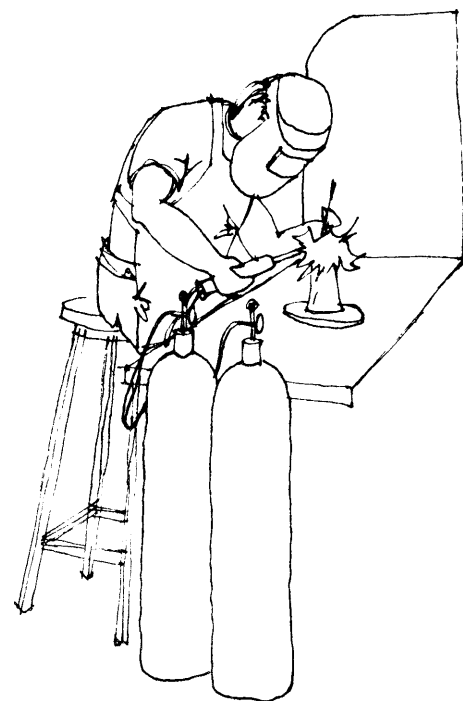
In the general work area, heating, ventilating, and air conditioning requirements are unchanged for typical arts and crafts spaces. Electric lighting should duplicate as much as possible daylight qualities for painting and drawing. In toxic chemical areas, sinks and traps must be acid resistant. Sewage treatment facilities may not accept acids, and in these instances provisions must be made for their storage and proper disposal. If acids are heavily used, special air exhausts are required. An emergency eye wash and shower must be provided.



Activities



3-5 Jewelry and Art Metal



a. ACTIVITIES

A knowledge of the properties of metals is basic to activities in the program. Processes include designing and construction with sheets, wires and tubes and soldering, welding and casting. Projects include various forms of jewelry, ornaments, hollow ware, welded metal sculpture and utensils executed in copper, bronze, silver, pewter, tin, lead and gold. Hand and power tools are used in the various processes. Design and construction of jewelry may require the addition of stone settings and coloring. Additional activities in this category include procedures for lapidary (cutting or polishing stones) and metal enameling (fusing color to metal in a kiln).

b. PARTICIPANTS

Fifteen to twenty participants can be accommodated at any one time sharing other activities with two staff members within the space allocated in a 20,650 square foot center.

c. PHYSICAL REQUIREMENTS

This program takes place within the general arts and crafts area. While the characteristics of the multi-purpose space are suitable for many activities in jewelry and art metal, there are some cautions that should be exercised in planning, depending on the extent of the program. For instance, welding and hot-metal casting should be set aside in an alcove with a hardened concrete floor. Acetylene torches should have a shielded work space with good mechanical ventilation. Special gas jets may be installed over work tables for fine soldering. Enameling involves the use of acids, kilns and blowtorches; therefore, the area where enamel is applied and dried should be apart from other areas to prevent spreading metal dust or jarring enamels that are drying. The dust from clay in the ceramics area is incompatible with the enameling process, and these two functions should be separated.

d. RECOMMENDED SPACE ALLOCATIONS

For a center of 20,650 square feet, approximately 1,200 square feet should be allocated to jewelry and art metal.

Work Area	800 square feet
Storage Area	200 square feet
Enameling Room	200 square feet

e. RELATED AREAS

Office
Other General Arts and Crafts

g. TECHNOLOGICAL REQUIREMENTS

A hand-drawn mind map with a central shaded circle labeled "Jewelry and Arts & Crafts". Arrows point from this central circle to several surrounding circles: "metalworking", "enameling", "jewelry", "lapidary", and "tumbling". The "metalworking" circle is further connected to "casting", "welding", and "soldering". The "jewelry" circle is connected to "polish" and "cutting". The "lapidary" circle is connected to "cutting".

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graph TD
    Central((Jewelry and Arts & Crafts))
    Metalworking((metalworking))
    Enameling((enameling))
    Jewelry((jewelry))
    Lapidary((lapidary))
    Tumbling((tumbling))
    Casting((casting))
    Welding((welding))
    Soldering((soldering))
    Polish((polish))
    Cutting((cutting))

    Central --> Metalworking
    Central --> Enameling
    Central --> Jewelry
    Central --> Lapidary
    Central --> Tumbling
    Metalworking --> Casting
    Metalworking --> Welding
    Metalworking --> Soldering
    Jewelry --> Polish
    Jewelry --> Cutting
    Lapidary --> Cutting
  
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The floor plan illustrates the layout of the Art Center, with various studios and their interconnections. Key areas include:

- Top Section:** Drawing and Painting, Acid Room, Storage.
- Middle Section:** Weaving, Textiles and General Handicrafts, Looms, Photography, Color Lab, Photo Finishing Area, Film Lab.
- Central Area:** Jewelry and Metal (circled in black), General Handicrafts.
- Bottom Section:** Sculpture and 3-Dimensional Design, Welding, Glassblowing.
- Left Side:** Photography, Color Lab, Photo Finishing Area, Film Lab, exhibit, tools, Tool Issues.
- Right Side:** Storage, materials, casting, enameling, exhaust, Storage, Storage, Storage.
- Central/Bottom:** control, Office, Welding & Soldering.

Hand-drawn annotations in black ink highlight specific paths and areas:

- A large circle around "Jewelry and Metal".
- Arrows pointing from "Jewelry and Metal" to "exhibit", "control", "welding & soldering", "materials", "casting", "enameling", and "exhaust".
- A dashed line connecting "control" to "General Handicrafts".

3-6 Weaving, Textiles and General Handicrafts

a. ACTIVITIES

This program covers a wide variety of activities. Loom weaving, tapestry work, batik, tie-dye, macrame, soft sculpture, banners, fabric collages, needlepoint, stitchery, and sewing are all part of this general category. In addition, leather craft, with its braiding, lacing, sewing and tooling, and other general crafts such as bookbinding, basketry, candle making and puppetry fall within the general handicrafts nomenclature.

b. PARTICIPANTS

A 20,650 square foot center would normally provide space for approximately 40 participants and two staff members to use the facilities at any one time.

c. PHYSICAL REQUIREMENTS

The general work area should be flexible to allow for frequently changing needs. Some activities will require a permanent setup, such as floor looms and sewing machines, and these may be installed in alcoves. The predominant arrangement, however, will be one of movable work tables and counters which can be adapted for a variety of crafts. Storage should be provided within a common room.

d. RECOMMENDED SPACE ALLOCATIONS

For a center of 20,650 square feet, approximately 1,700 square feet should be allocated to weaving, textiles and general handicrafts.

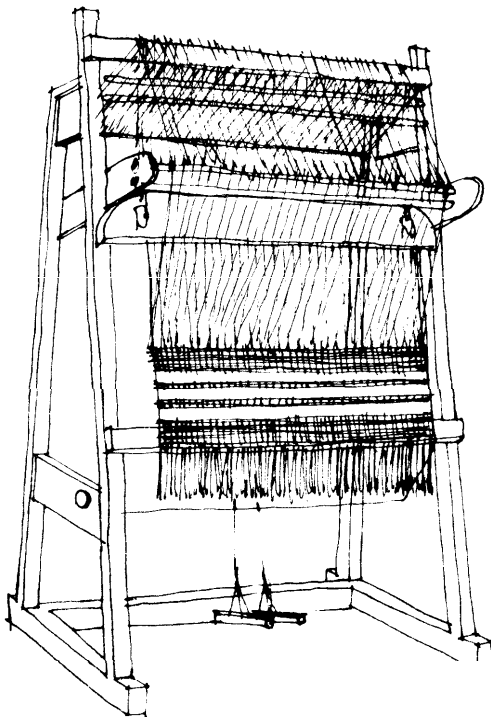
Work Area	1,000 square feet
Weaving Area	400 square feet
Storage Area	300 square feet

e. RELATED AREAS

Office
Library/Lounge/Exhibit Area
Studio/Classroom/Gallery

f. FURNISHINGS - EQUIPMENT

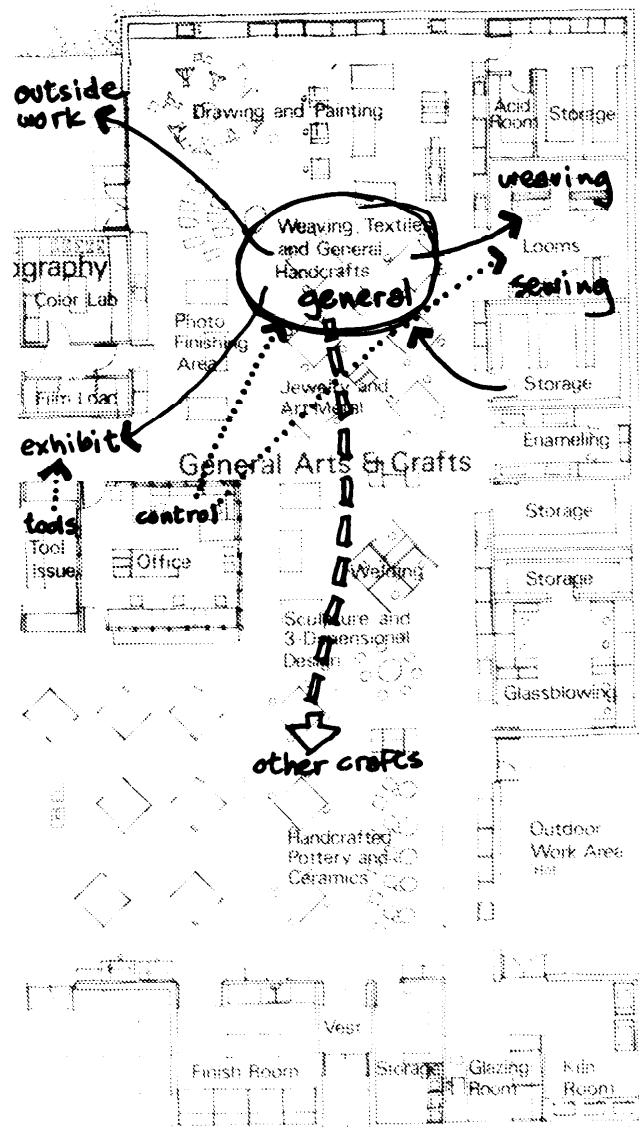
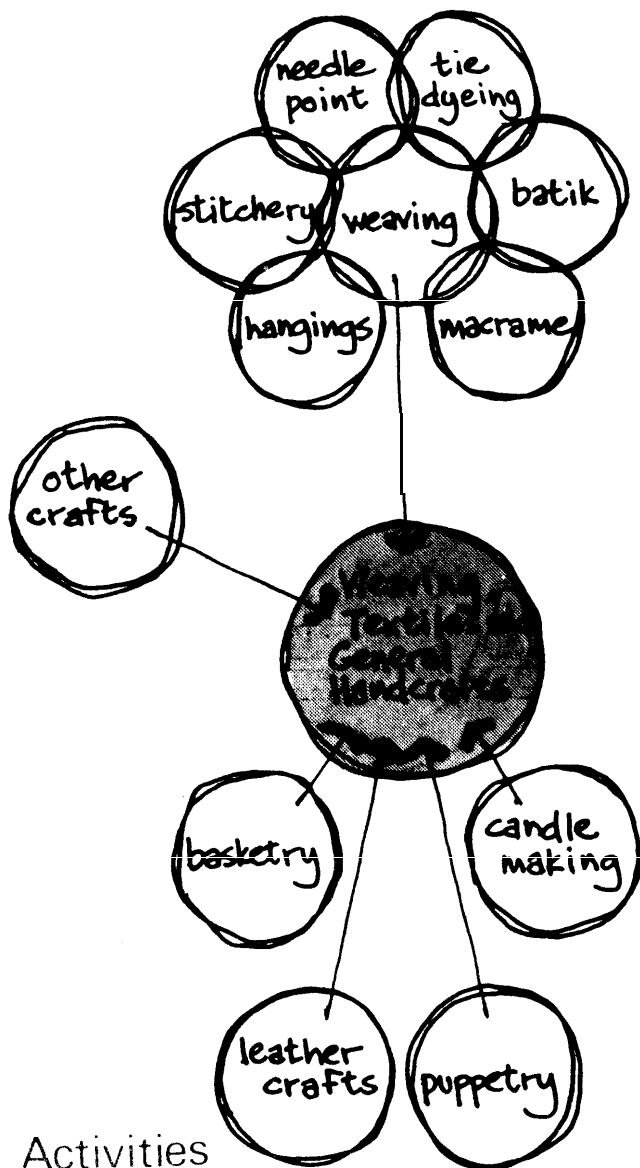
The basic furnishings consist of workbenches, tables, and stools. Much of the specialized equipment is portable. Foot powered looms occupy considerable floor space when in operation but may be moved together and stored when not in use. Table looms, rug looms, and tapestry frames can be utilized on table tops and stored when not



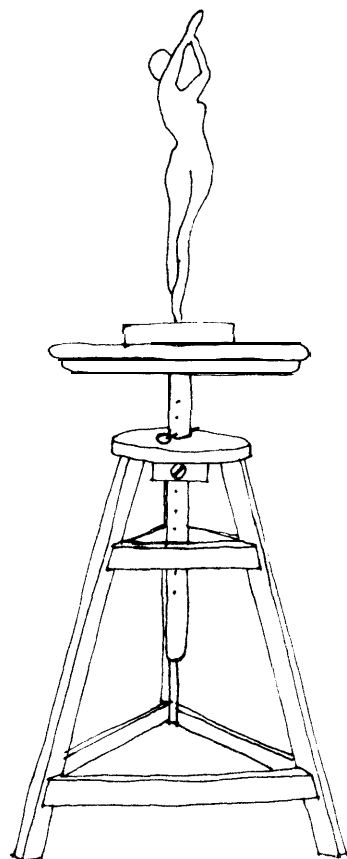
in use. Heavy-duty sewing machines are essential in a textile program. Enamel pans, hot plates and drying racks are necessary for dyeing.

g. TECHNOLOGICAL REQUIREMENTS

There are no unusual requirements for heating, cooling and ventilating. Service sinks should be provided. Gas and compressed air should be available in the general work space for other nontextile handicrafts. 110 volt service and an overall lighting level of 70 footcandles is adequate. Some direct lighting on sewing machines and looms where close work is necessary may be required.



3-7 Sculpture and Three-Dimensional Design



a. ACTIVITIES

This branch of the program covers the use of materials and techniques to produce three-dimensional objects, figures, or construction in the round or half round. Processes in sculpture involve clay modeling, wood carving, stone cutting, plastic work, metal casting and welding. Model building, paper mache work, displays and exhibition properties and interior decoration are additional activities within this category.

b. PARTICIPANTS

This activity interests people of all ages, and a wide variety of participants might be expected. The number of persons actively working on projects may be as many as 20, with even more participating in classes. Some processes, particularly casting and foundry work, require the combined efforts of two or more persons. One or two staff members should be present for supervision.

c. PHYSICAL REQUIREMENTS

Many activities will take place in the general arts and crafts area without special modifications. Projects such as clay sculpture, welding, or woodcarving can utilize the same areas provided for pottery, art metal, woodwork, and outdoor projects. Large exhibition work requires unobstructed space.

d. RECOMMENDED SPACE ALLOCATIONS

For a center of 20,650 square feet, approximately 1,400 square feet should be allocated to sculpture and three-dimensional design.

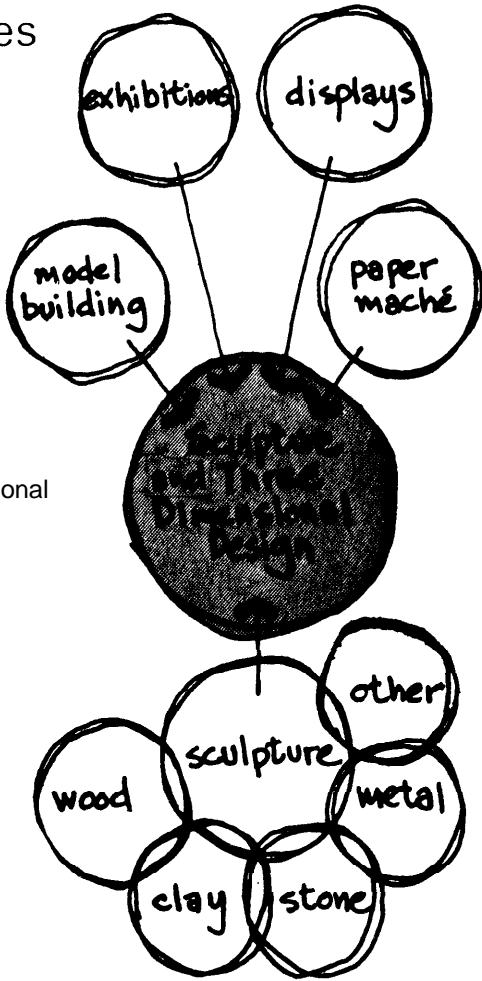
Work Area	1,000 square feet
Storage Area	200 square feet
Covered Exterior Work Area	200 square feet*

*Amount Indicates half of actual exterior area provided since covered exterior work area is programmed as half of interior building space.

e. RELATED AREAS

Office
Studio/Classroom/Gallery
Handcrafted Pottery and Ceramics
Jewelry and Art Metal
Woodwork and Repair
Drawing and Painting
Exterior Work Areas

Activities



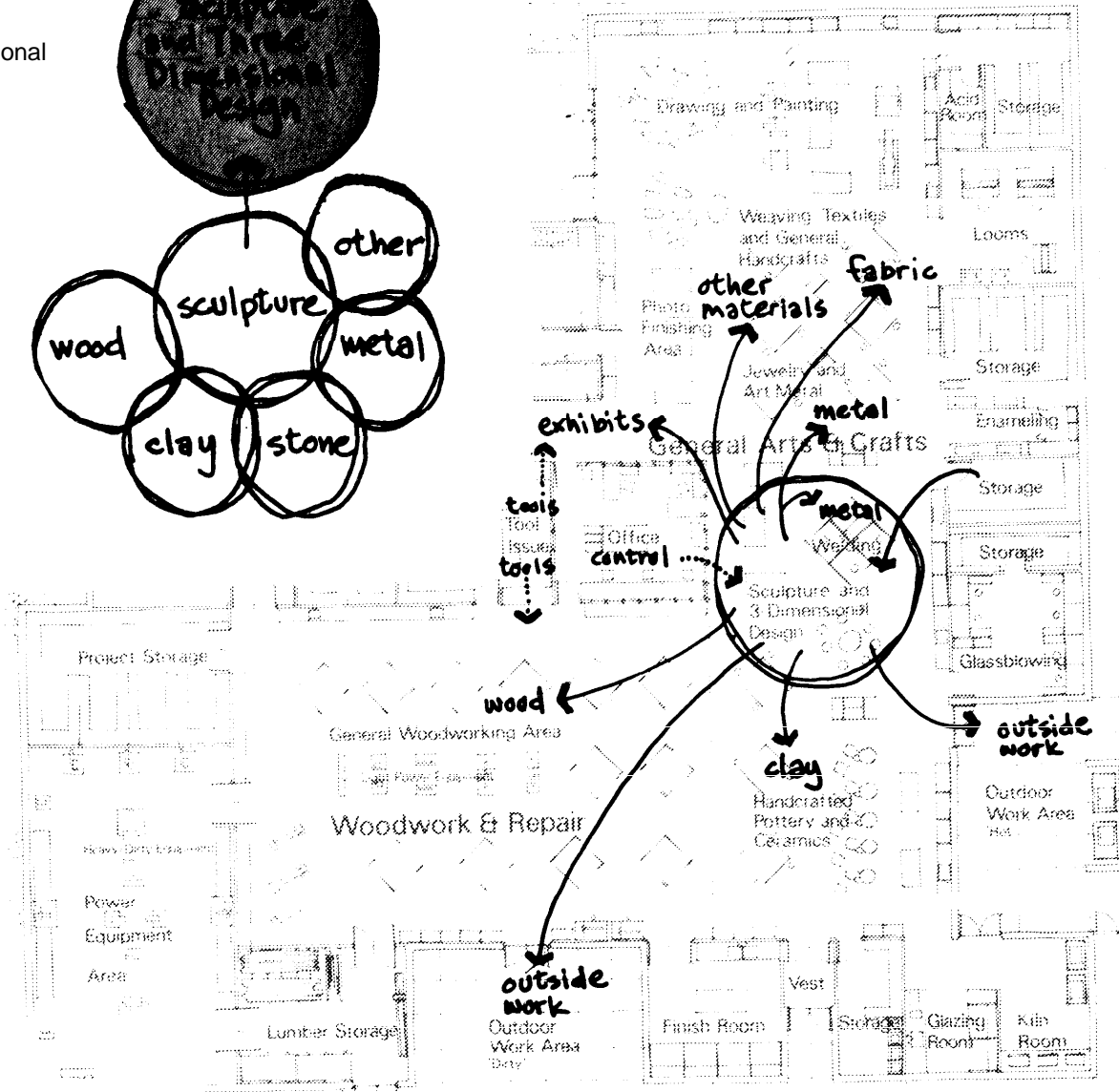
Sculpture and Three Dimensional Design

f. FURNISHINGS – EQUIPMENT

Major items include floor and table sculpture stands, several sets of hand chisels, portable electric chisels, grinding and buffer arbor, welding equipment and a heavy anvil. Workbenches and stools already provided in the general arts and crafts area are adequate for most projects. Wood-working power tools, kilns and furnaces used in other activities can be shared.

g. TECHNOLOGICAL REQUIREMENTS

Special requirements for welding and heat-generating equipment has been outlined previously in Section 3-5.



3-8 Photography

a. ACTIVITIES

(1) Basic processes of photography remain the same although there are wide differences in sophistication of equipment, techniques of still and motion pictures, and variations between monochromatic and color film. Film processing consists of loading, developing, enlarging, print washing, drying, trimming, and mounting. Other elements of the center's photography program include studio work, film and slide projection, demonstrations, classroom instruction, and exhibits.

(2) There are three basic functional areas in a photography department: the studio/classroom/gallery which may be shared with the other craft activities; the photographic laboratory where film processing takes place; and the finishing work area where prints are dried, trimmed and mounted. The photographic laboratory should be divided into two separate areas when both monochromatic and color film are processed.

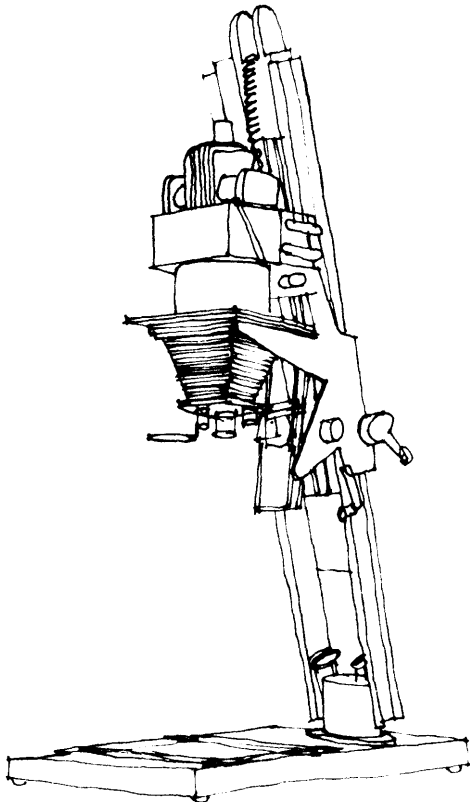
b. PARTICIPANTS

Photography is one of the most popular activities in the Army arts and crafts program. This size of facility will accommodate a maximum of 50 participants at any one time: 25 users and one or two staff members in the studio/classroom/gallery with a similar number in the laboratory and finishing area.

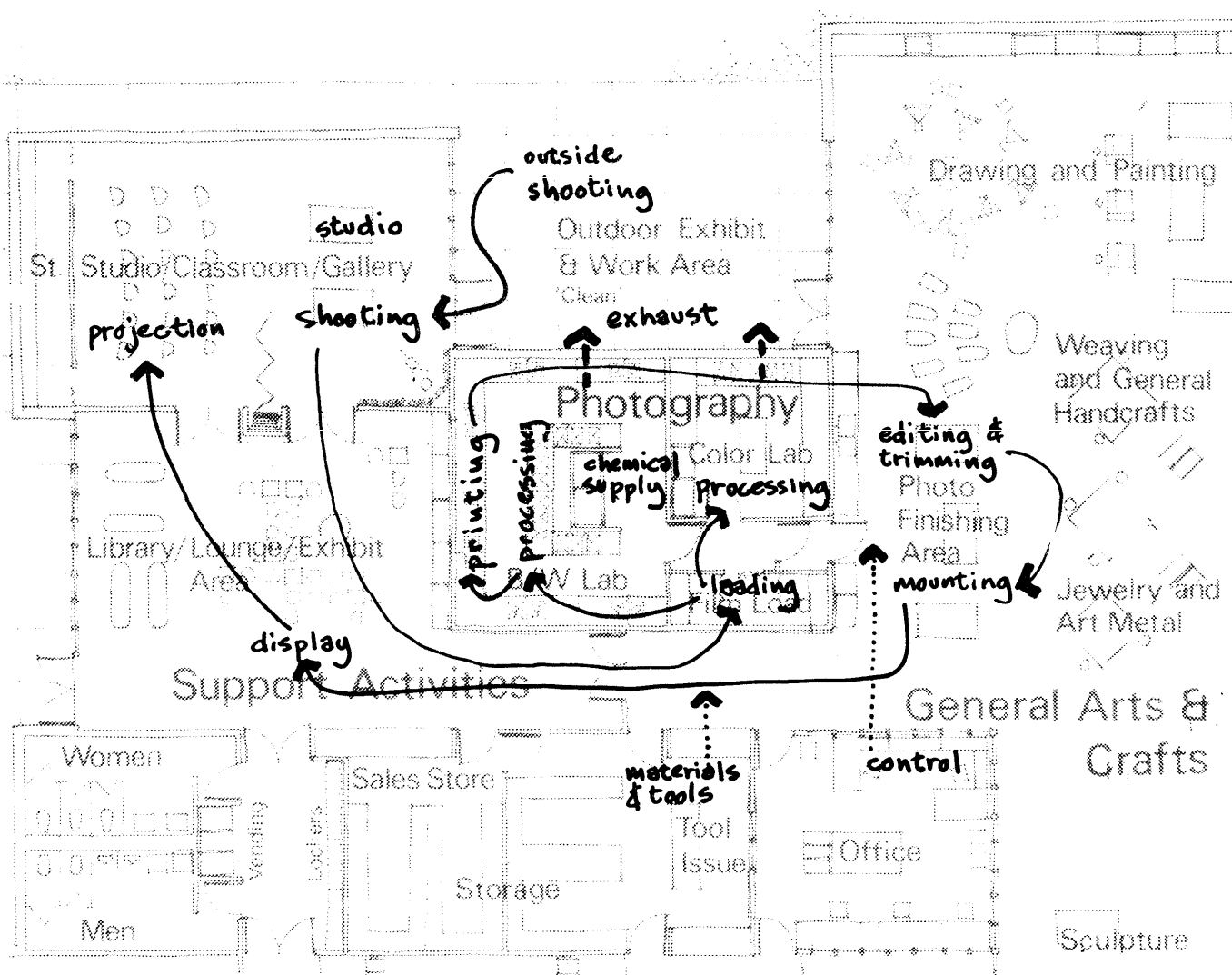
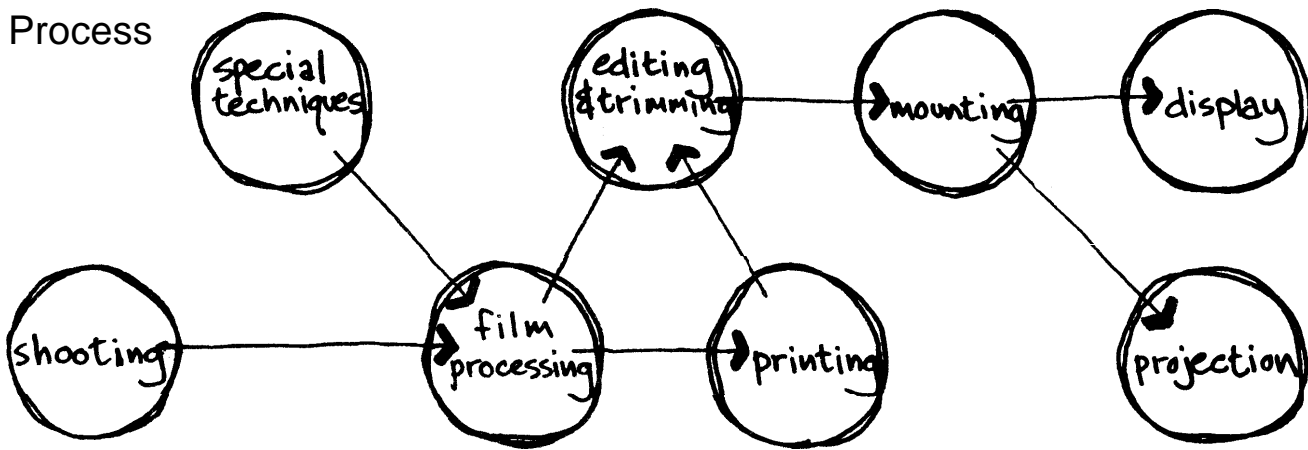
c. PHYSICAL REQUIREMENTS

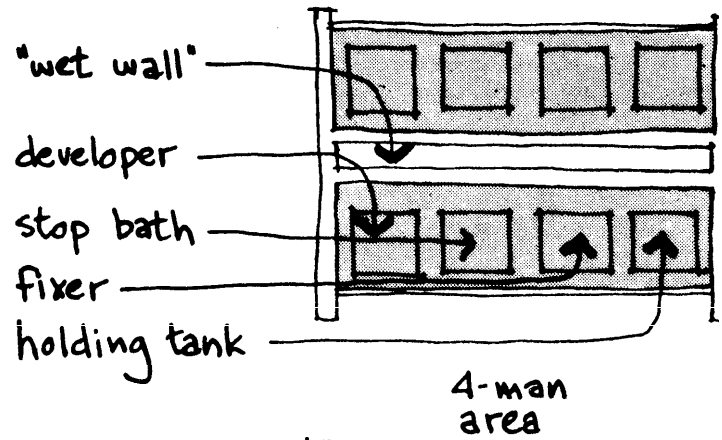
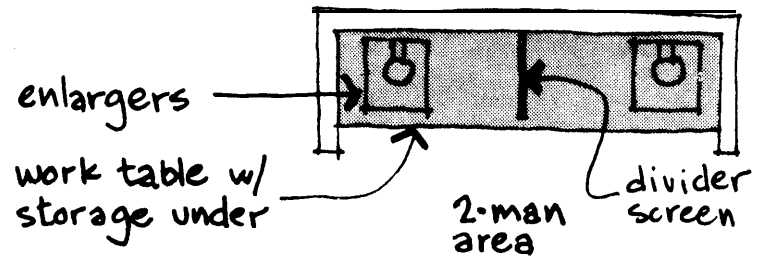
(1) The studio/classroom/gallery is a multi-use area that should be designed with flexibility in mind. For use as a portrait studio, it should have effective light control at windows to bar extraneous light. An adjacent closet for storing chairs, props and equipment is desirable, as is a pull-down screen for projection. When used as a gallery, continuous wall tracks and wall systems for hanging displays reduce special exhibit requirements and simplify hanging backdrops for portrait use. A chalkboard should be included for instruction. A folding partition adds to the flexible use of this space. Ceilings should be designed to allow for spotlights to be attached for illuminating exhibits.

(2) The photo lab encompasses all activities of film processing. It starts with film loading which takes place in totally dark cubicles. The monochromatic film processing darkroom is used with safe lights, but conventional color film processing requires a separate darkroom with total darkness. However, recent advances in color films will undoubtedly reduce light safeguard requirements. A red glass

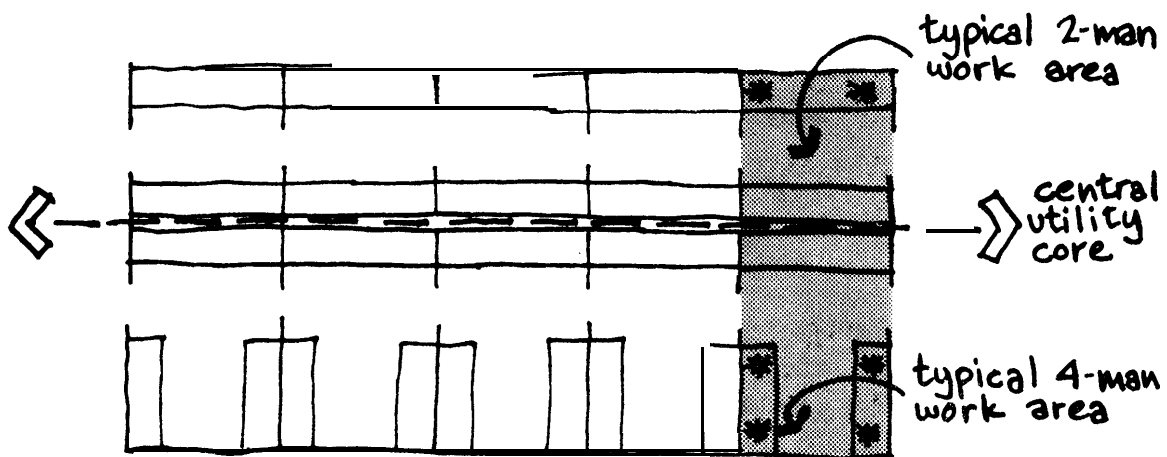
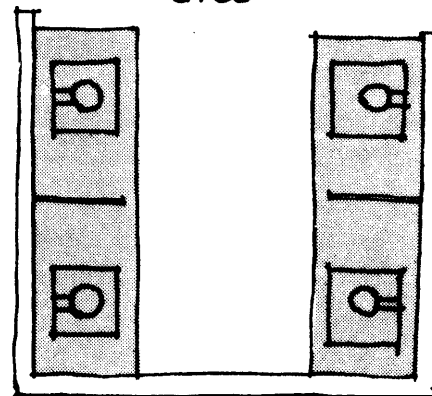


Process





Optional 2-4 Man Work Areas



partition (red plastic over glass) has been successful in some photo lab work areas. Dark rooms require light-trap entrances. Room surfaces in the processing area should be nonporous, easily cleaned and chemical resistant.

(3) The finishing work area need not be a particularly specialized space. There are no special lighting or isolation requirements. In fact, except for the storage of some special equipment, there is no real impediment to using shared space for this activity. In particular, it relates closely to the graphic arts.

(4) In larger photo facilities, thought should be given to providing separate space for a staff office and a central storage room.

(5) Physical arrangements can be varied from the large general dark rooms to smaller activity centers with work areas for two to four people. Various options are illustrated on page 40.

d. RECOMMENDED SPACE ALLOCATIONS

(1) For an Arts and Crafts Center of 20,650 square feet an area of approximately 2,065 square feet is recommended.

(2) The following suggested breakdown assigns space to general functional areas without endorsing any particular layout:

Monochromatic Processing Lab	600 square feet
Color Processing Lab	200 square feet
Film Loading Room	65 square feet
Finishing Area	400 square feet
Storage Area	100 square feet
Studio/Classroom/Gallery	500 square feet* *
Covered Exterior Work Area	200 square feet*

*Amount indicates half of actual exterior area provided since covered exterior work area is programmed as half of interior building space.

** 50% of Studio/Classroom/Gallery attributable to Support activities (Paragraph 3-10).

e. RELATED SPACES

(1) The studio/classroom/gallery should be near the main entrance, library/lounge/exhibit area, and office.

(2) The finishing area should be convenient to the graphic arts area. Possibly it can be a shared area.

f. FURNISHINGS - EQUIPMENT

(1) Equipment requirements may vary depending upon

the emphasis of particular programs. The following list is general in nature:

(2) Studio/Classroom/Gallery—Backdrops, mobile rear screen projector, stacking chairs, film and slide projectors.

(3) Photo Finish Area—drymounting presses, papercutter, sink, print drying cabinets, print dryers, copy camera, work tables and counters.

(4) photo Laboratories—enlargers, refrigerator, contact printers, developing sinks, film drying cabinets, papercutter, paper cabinets, metal-lined cabinets, print washers, safe light, timers.

g. TECHNOLOGICAL REQUIREMENTS

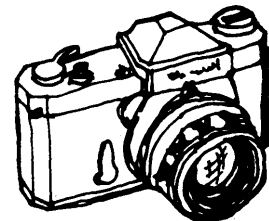
(1) photo work is generally performed in an enclosed controlled environment. Air conditioning systems which maintain even temperature, constant relative humidities and frequent air changes are necessary. Dust elimination filters are important. Louvers should be light sealed.

(2) Hot and cold water supplies with mixing faucets and temperature controls are needed in the laboratories. In some areas special filters will be required to remove mineral deposits in the water. Sinks should be stainless steel with chemical resistant traps. Consideration must also be given for provision of an industrial waste line or holding tank for spent photographic liquids.

(3) The studio/classroom/gallery requires ceiling outlets for use of special lights. These should be controlled by rheostats. There should also be adequate outlets for photo-floodlights and projectors.

(4) Sodium vapor safe lights, which are used in monochromatic printing, are brighter and more maintenance free than other types. They may require baffles or filters. Key operated auxiliary lighting should be provided in darkrooms for cleaning purposes.

(5) In the processing room, adequate outlets are required for enlargers, timers and safe lights. Print dryers and drymounting presses should be on separate circuits. Continuous outlets mounted one foot above counter height are very desirable.



3-9 Woodwork and Repair

a. ACTIVITIES

(1) The woodworking program requires space and equipment for a variety of general carpentry and cabinetry activities. These include furniture design, construction, repair and refinishing, upholstery, turning, pattern work, picture framing and rough carpentry projects.

(2) Although the woodworking portion of the arts and crafts program includes repair of small appliances, radios, television sets and other electronic equipment, it should not be done in the woodworking area. Repairs of this nature should be done in the more dust-free areas, such as the general arts and crafts area.

b. PARTICIPANTS

Woodworking is performed primarily by career military and retired personnel. The shops are less used by dependents. Most participants work independently on projects. In a 20,650 square foot center the number of users should be limited to a maximum of 40 at any one time, for which at least three supervisory personnel should be present at all times.

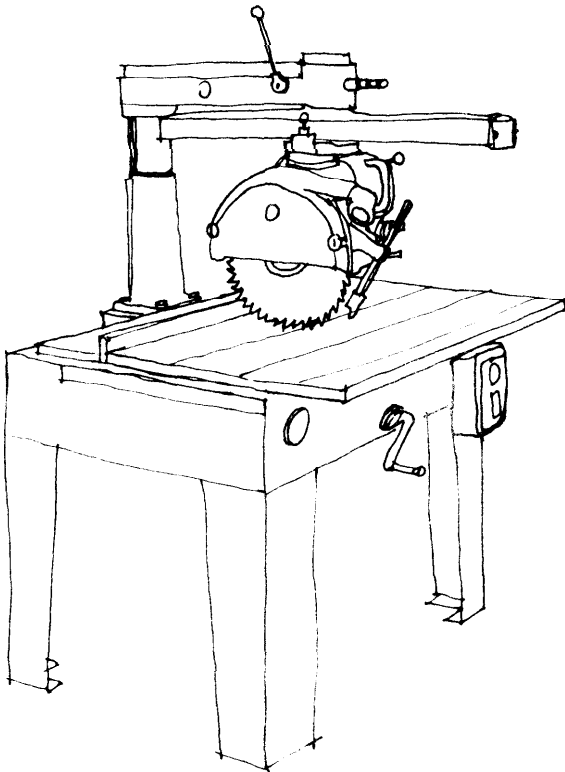
c. PHYSICAL REQUIREMENTS

(1) Within the woodworking area, space must be provided for the following activities: receiving and storing lumber, using fixed-power equipment, building projects both large and small, using hand tools, finishing, hand sanding, storing projects, issuing tools, demonstrations, and controlling the operations of the shop.

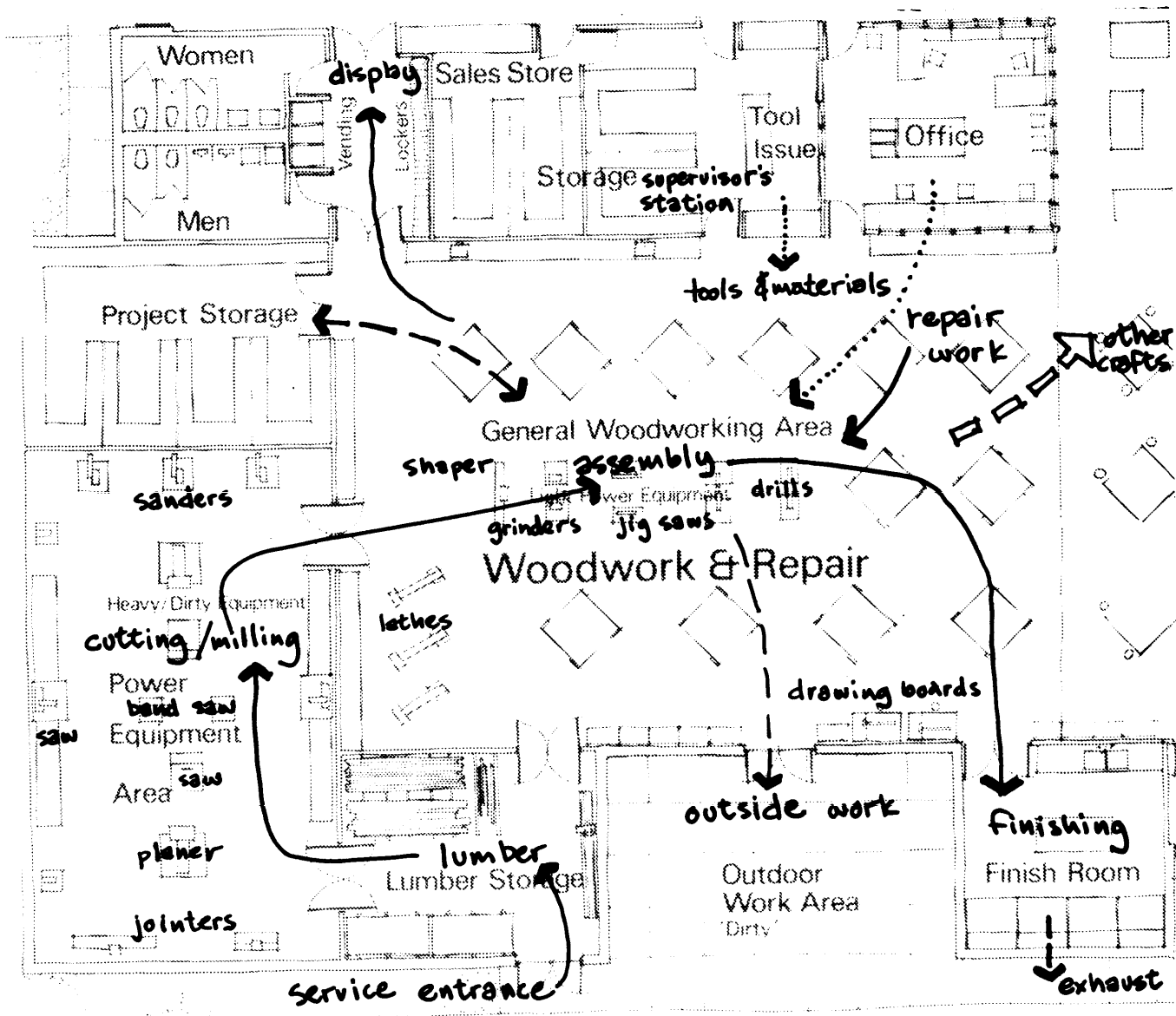
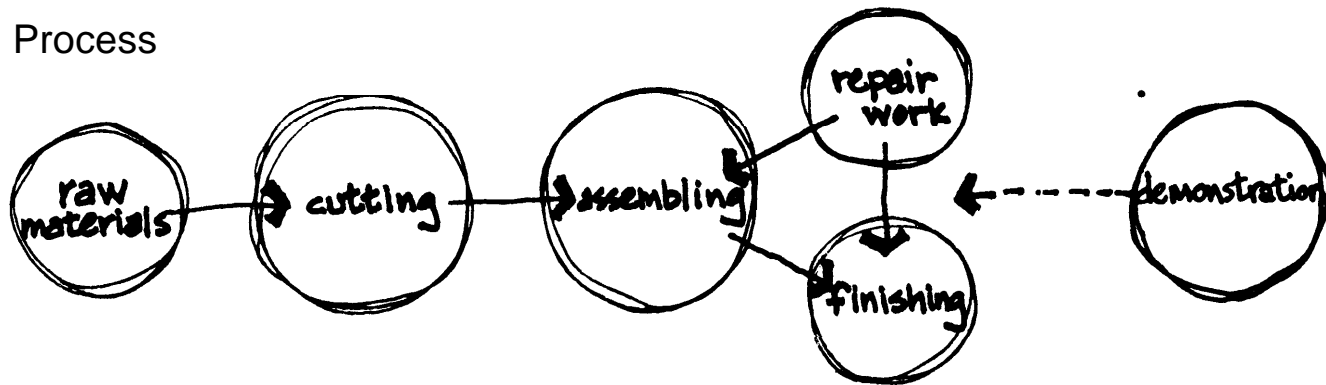
(2) Shop layout will depend on the overall approach to sharing space with other activities in the center. In any case, noisy, dusty machines should be separated from the general work area. Finishing and drying requires a separate dust-free space. Where possible these activities should be in separate rooms. Consideration might be given to the use of a self-contained auto-type spray booth as a finishing room with access arranged through a vestibule serving both the shop and an outdoor work area. A small space with drawing board is desirable for project planning. The lumber storage area should be near the major fixed equipment.

(3) The plan should be based on safe functional operation of activities and flow of materials and personnel. Operational clearances required for various types of power equipment are shown on the plan on page 44.

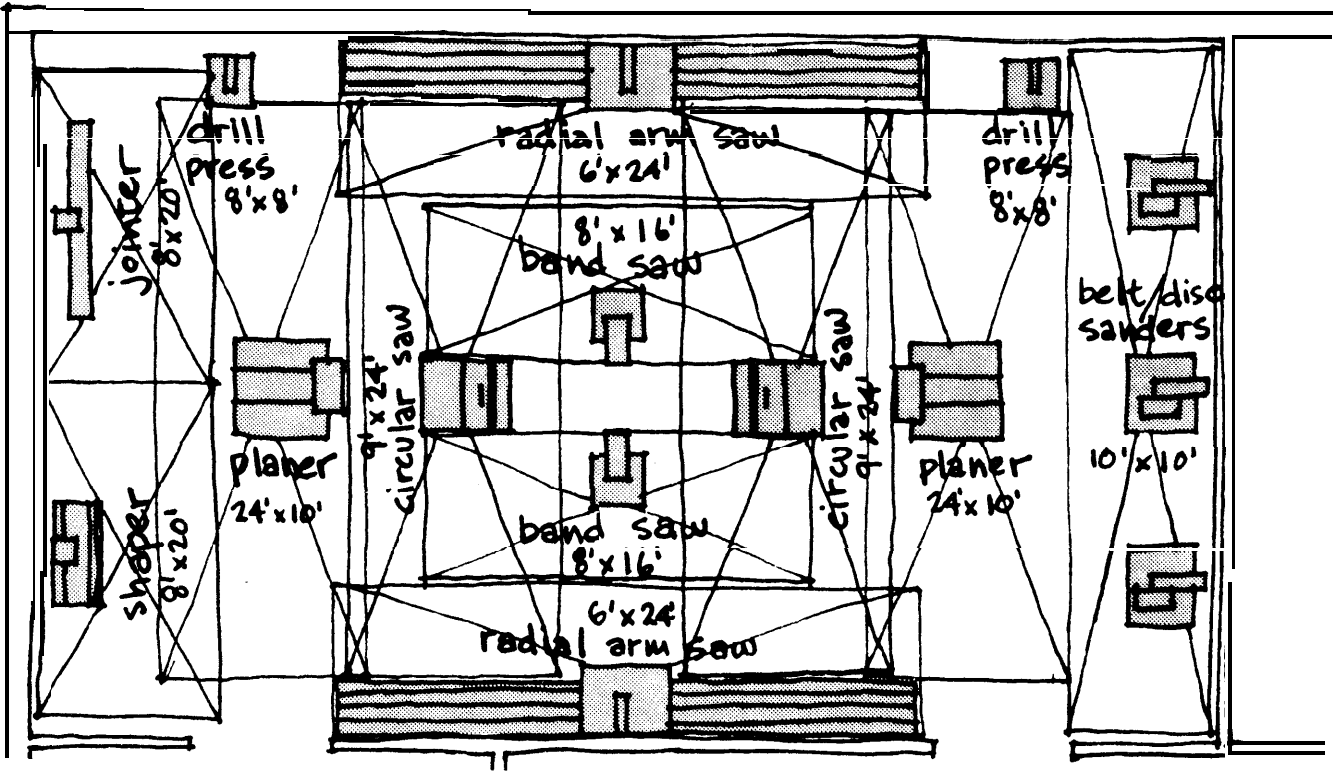
(4) Hardened concrete floors are most common in woodworking shops. Wood floors offer a softer walking surface and better acoustics, but they have higher initial cost and



Process



Operational Clearances



greater maintenance. Floors should be nonslip. Low windows are not desirable but windows may be provided above door head height. All glazing should be wire glass or plastic.

d. RECOMMENDED SPACE ALLOCATIONS

For a center of 20,650 square feet, approximately 7,225 square feet should be allocated for woodworking.

General Work Area	3,025 square feet
Power Equipment Area	2,000 square feet
Lumber Storage	500 square feet
Project Storage	600 square feet
Finish Room	400 square feet
Tool Issue Room and Supervisor's Station	300 square feet
Covered Exterior Work Area	400 square feet*

* Amount indicates half of actual exterior area provided since covered exterior Work area is programmed as half of interior building space.

NOTE: [For safe working conditions an allowance of 75 to 125 square feet per person is required (includ -

ing machinery) in woodworking according to type of activity in progress.]

Width/length ratio of work area:	minimum 1/1, maximum 1/2
Minimum width of general work area:	30 feet
Minimum ceiling height:	12 feet

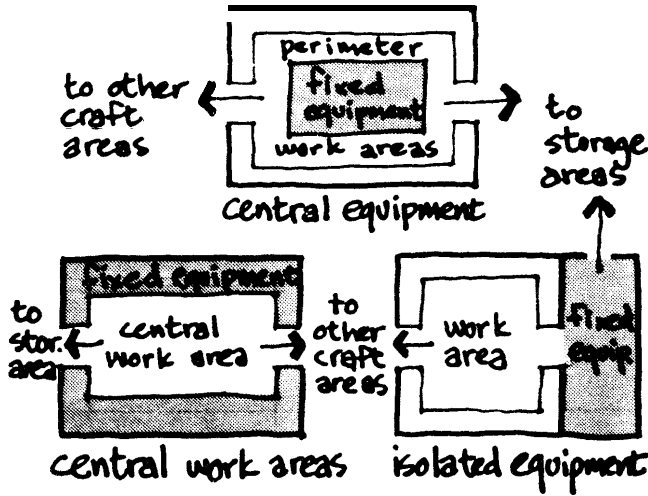
e. RELATED SPACES

The woodworking shop should be located in an area of the building which isolates noise. A supervisor's station should be near or part of office and tool issue room. The service and material receiving entrance should be under staff supervision. Convenient access is needed to the technical reference library. Wash-up areas and lockers for work clothes should be provided near the shop entrance.

f. FURNISHINGS - EQUIPMENT

(1) The National Safety Council and Army Safety Directors urge that special precautions be taken in all wood-working areas to prevent accidents to participants. All

Shop Arrangements



fixed power tools should be surrounded by "safety islands" marked with tape and should be separated from general circulation and arranged so that ample space is provided for the operator and task. Aisles should be generous enough to permit free two-way passage. Workbenches should be grouped and spaced according to sizes of anticipated projects. Tools and equipment should be of industrial quality. Each machine must have a guard attached and locked on and a safety cut-off switch in addition to the master switch for the area. Power tools should be grounded. Floors should have a non-slip finish. Color coding machinery will contribute to safe operations. It is recommended that the center's director and the supervisors of the woodworking activities become familiar with the safety requirements for woodworking power tools as set forth in the Occupational Safety and Health Act of 1970.

(2) The following list notes the major items of equipment which are typical for a woodworking facility of approximately 7,225 square feet: Radial arm saws, wood lathes, four-station work benches, band saws, drill presses, jig saws, circular saws, disc sanders, belt/disc sanders, jointers, shapers, panel saws, surface planers, hand tools, vises, lockers, and storage cabinets.

g. TECHNOLOGICAL REQUIREMENTS

(1) A dust removal system is an important feature for the safe operations of power equipment. This should be placed underfloor or overhead and be fitted with flexible hose connections. In new construction, the more preferred underfloor system provides a permanent, relatively quiet, obstruction free installation but it is less flexible,

more difficult to reach for maintenance and generally more expensive than an overhead system. In either case, all secondary runs must enter main ducts at acute angles, and clean out points should be provided at all angular connections. Extra hookup points should be provided for future equipment needs and for use as a built-in vacuum cleaning system. For safety, noise reduction and waste disposal, dust collection hoppers and fans should be placed outside.

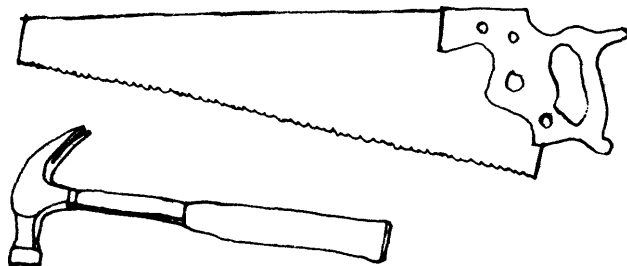
(2) Woodworking power equipment generates a high noise level. Within prudent construction limitations, sound absorbent materials should be used on ceilings and walls in fixed equipment areas. Sound insulation pads should be used under the bases of rotating, vibrating, or impact machinery. Noisy equipment may be sound isolated from other work areas by solid walls or double-glazed safety-glass partitions.

(3) Adequate ventilation, temperature, and relative humidity controls are design considerations that affect the usefulness of the spaces. Relative humidity should be maintained at a level to prevent the surface oxidation of tools and machines and the delamination of wood joints. The ventilation system design must take into consideration the required air changes per occupant, and the exhaust system of the power tools. Spray booths must have exhaust fans.

(4) In particular, lumber storage and finishing areas must be sprinklered. At least one service sink with hot and cold water should be provided. A sink with sediment trap is desirable in or near the finishing room.

(5) Proper lighting reduces accidents. A minimum of 70 footcandles of shadow-free, glare-free illumination should be maintained at working surface height.

(6) The finishing room requires explosive free fixtures and switches. Circuit breakers must be provided for each machine. Outlets should be convenient to work stations for portable power tool use. A main power panel must be located at the supervisor's station.



3-10 Support Activities

a. ACTIVITIES

This category covers those functions which are not assignable to a particular program. Spaces for these include the office, sales store, tool issue and storage, library/lounge/exhibit areas, studio/classroom/gallery, circulation, lobby, lockers, utility, and service areas.

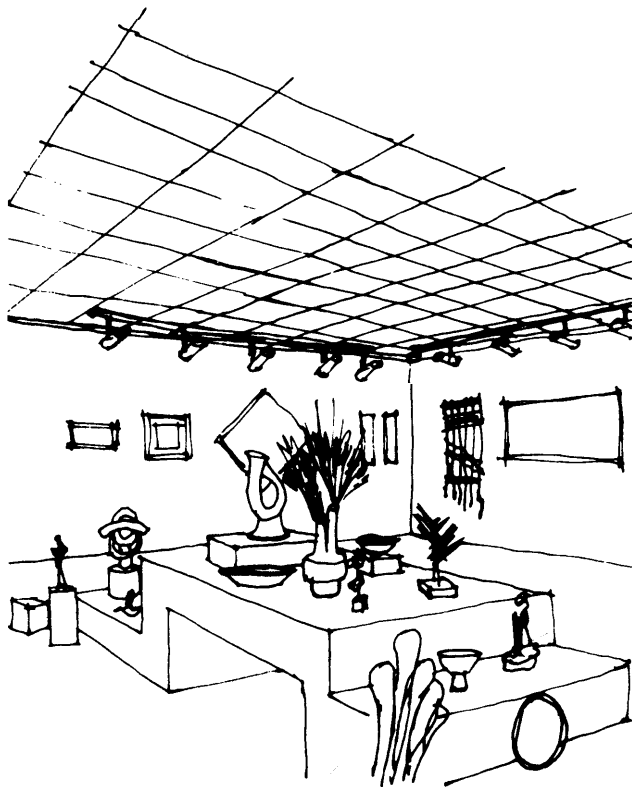
b. PARTICIPANTS

All participants of the Arts and Crafts Center use the support facilities at various times. The lobby and circulation areas serve as the transitional zone for all participants entering the center. There might be as many as 200 participants in the building at one time. The office, sales store, tool issue and storage room will generally each have no more than two staff members present. Seating in the library/lounge/exhibit area should accommodate about 15. Depending on its use, as many as 30 participants might be in the studio/classroom/gallery at one time.

c. PHYSICAL REQUIREMENTS

(1) The office and its related space should be centrally located for supervision of both entrance and work areas. The sales store and tool issue area should be adjacent to the office and in direct visual control of the lobby. It is here that materials and tools are dispensed and completed projects are displayed for sale. It is desirable that the tool issue and storage room be adjacent to the sales store so that one supervisor can control both areas. The library/lounge/exhibit area is in reality an adjunct of the building circulation area adjacent to the entrance. The library itself is an informal collection of reference material relating to various arts and crafts and activities. It also must be visually supervised. The character of this space should be one of relaxation. It is the principal meeting spot for those taking part in the various programs and, as such, it is an important location for the interchange of ideas and display of work by participants.

(2) The studio/classroom/gallery is a multi-purpose area that relates to most of the arts and crafts activities. At various times it serves as a classroom, portrait studio, reception area, and exhibit space. Ideally, it should be located near the main entrance with the possibility of being opened to the library/lounge/exhibit area and lobby. It would also be desirable to have the studio/classroom/gallery open to an outdoor sculpture court. The gallery must have a system for exhibiting many types of arts and crafts. The walls might possibly have display board material or have other systems for hanging displays.



d. RECOMMENDED SPACE ALLOCATIONS

For a center of 20,650 square feet, approximately 3,100 square feet should be allocated to support activities.

Office	300 square feet
Sales Store	200 square feet
Tool Issue and Storage	300 square feet
Library/Lounge/Exhibit Area	600 square feet
Studio/Classroom/Gallery	500 square feet*
Lockers and Vending	100 square feet
Restroom	300 square feet
Circulation	800 square feet

*50% of Studio/Classroom/Gallery attributable to Photography (Paragraph 3-8).

e. RELATED SPACES

The support areas should be convenient to all major work areas.

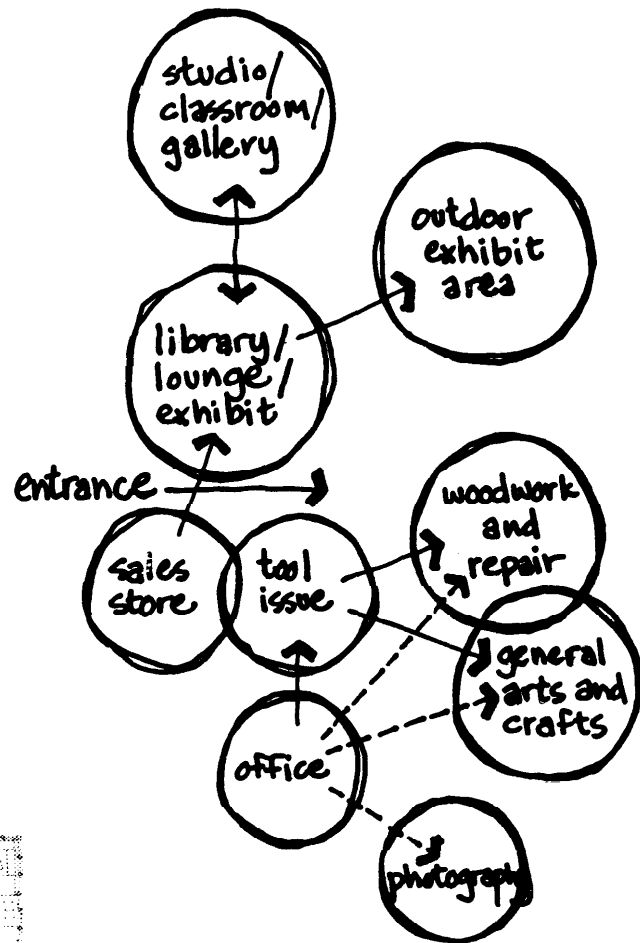
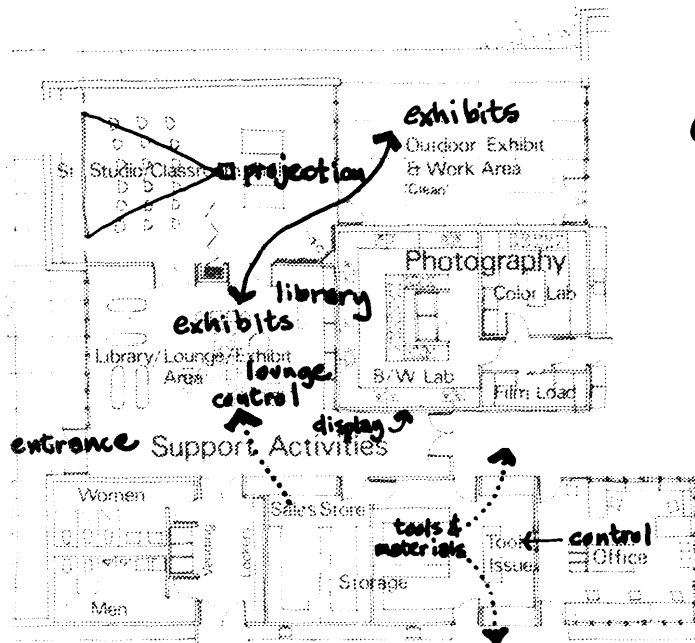
f. FURNISHINGS - EQUIPMENT

Display cabinets and bulletin boards are required in the lobby. An outdoor display board is important to advertise the center's programs. A built-in sales counter with locked display case and a safe are required in the sales store. Lockers for work clothes should be placed away from the main entrance but convenient to the shops. The office should have attractive and functional office furniture,

including desks, chairs, file cabinets, work counters, bookshelves and display panels. Lounge chairs, sofas, low tables, table lamps, and bookcases are appropriate in the library/lounge/exhibit area. Stacking chairs, a lectern, tables, and overhead pull down projection screen should be provided in the studio/classroom/gallery. If possible, carpet is desirable throughout the main support areas.

g. TECHNOLOGICAL REQUIREMENTS

Heating, ventilating and air conditioning requirements are standard for off ice, classroom, and circulation spaces, with the added provision that large group use of the studio/classroom/gallery is anticipated. Electrical requirements for the studio/classroom/gallery should consider flexible overhead lighting, outlets for audio-visual equipment, and rheostat lighting control. The primary electric panel should be placed in or near the sales store or the office.



Activities

3-11 Summary of Space Allocations

Table A
Self-Contained Example

SPACE	UNIT AREA	ACTIVITY AREA	SPACE	UNIT AREA	ACTIVITY AREA
1. GENERAL ARTS AND CRAFTS			2. PHOTOGRAPHY		
Handcrafted Pottery and Ceramics		1600	Monochromatic Processing Lab	600	
General Work Area	1000		Color Processing Lab	200	
Kiln Room	200		Film Loading Room	65	
Storage Area	200		Finishing Area	400	
Exterior Work Area	200**		Storage Area	100	
			Studio/Classroom/Gallery	500*	
Glassblowing		600	Exterior Work Area	200**	
General Work Area	400		Total		2065 square feet
Storage Area	100				
Exterior Work Area	100**		3. WOODWORK AND REPAIR		
			General Work Area	3025	
Drawing and Painting		1760	Power Equipment Area	2000	
General Work Area	1200		Lumber Storage Area	500	
Acid Room	60		Finish Room	400	
Storage Area	300		Project Storage Area	600	
Exterior Work Area	200 **		Tool Issue Room and Supervisor's Station	300	
			Exterior Work Area	400**	
Jewelry and Art Metal		1200	Total		7225 square feet
General Work Area	800				
Enameling Room	200		4. SUPPORT ACTIVITIES		
Storage Area	200		Office	300	
			Sales Store	200	
Weaving, Textiles and General Handicrafts		1700	Tool Issue and Storage Area	300	
General Work Area	1000		Library/Lounge/Exhibit	600	
Weaving Area	400		Studio/Classroom/Gallery	500*	
Storage Area	300		Restrooms	300	
			Lockers and Vending Area	100	
Sculpture and Three-Dimensional Design		1400	Circulation	800	
General Work Area	1000		Total		3100 square feet
Storage Area	200				
Exterior Work Area	200 **		GROSS BUILDING AREA		20,650 square feet
Total		8260 square feet			

*Space divided equally for Support Activities and Photography.

** The amount of space indicated is only half the amount which can actually be provided within the authorized space allowances, because for programming purposes, covered outdoor spaces are calculated as half the size of indoor spaces.

Table B
 Shared Space Example

SPACE	UNIT AREA	ACTIVITY AREA
1. Shared General Work Area		8425
Handcrafted Pottery and Ceramics	1000	
Drawing and Painting	1200	
Jewelry and Art Metal	800	
Weaving, Textiles and General Handicrafts	1000	
Sculpture and Three- Dimensional Design	1000	
Photo Finish Area	400	
Woodwork and Repair	3025	
2. Shared General Storage Areas		1200
Glassblowing	100	
Drawing and Painting	300	
Jewelry and Art Metal	200	
Weaving, Textiles and General Handicrafts	300	
Sculpture and Three- Dimensional Design	200	
Photography	100	
3. Exterior Work Area (clean)		400**
4. Exterior Work Area (dirty)		900**
5. Kiln Room		200
6. Ceramics Storage Area		200
7. Glassblowing Work Area		400
8. Acid Room		60
9. Enameling Room		200
10. Weaving Area		400
11. Monochromatic Photo Processing Lab		600
12. Color Photo Processing Lab		200
13. Film Loading Room		65
14. Power Equipment Area		2000
15. Finish Room		400
16. Lumber Storage Area		500
17. Project Storage Area		600
18. Office		300
19. Sales Store		200
20. Tool Issue and Storage Area		600
21. Library/Lounge/Exhibit		600
22. Studio/Classroom/Gallery		1000
23. Restrooms		300
24. Lockers and Vending Area		100
25. Circulation		800
GROSS BUILDING AREA		20,650 square feet

* * The amount of space indicated is only half the amount which can actually be provided within the authorized space allowances, because for programming purposes, covered outdoor spaces are calculated as half the size of indoor spaces.